

SHIP PRODUCTION COMMITTEE
FACILITIES AND ENVIRONMENTAL EFFECTS
SURFACE PREPARATION AND COATINGS
DESIGN/PRODUCTION INTEGRATION
HUMAN RESOURCE INNOVATION
MARINE INDUSTRY STANDARDS
WELDING
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Paper No. 4: MAPS - GP (Graphic Piping) Present and Future Capability

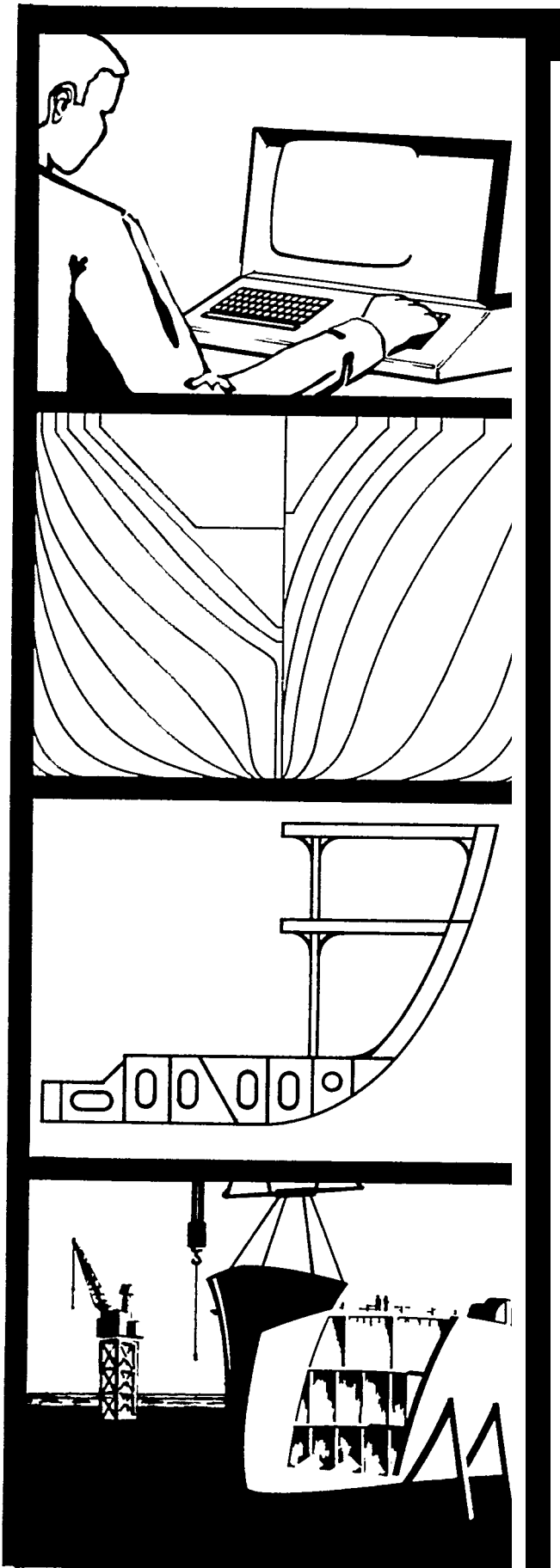
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MAPS-GP (GRAPHIC PIPING)
PRESENT AND FUTURE CAPABILITY

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Mr. Kobayashi is a member of the engineering department in the system headquarters and is the group leader of the team developing MAPS-GP. His past experience includes work with a graphic N/C system for steel plate flame cutting and a graphic piping system for a chemical plant.

Mr. Kobayashi is a graduate of Tohoku University, department of science.

MAPS

Ž Originaly

Ž Mksui Automated Pipe Shop system

(Mitsui Shipbuilding & Engineering Co., LTD.)

present

Ž Mitsui Advanced production System

(Mitsui Engineering & Shipbuilding Co., LTD)

MAPS-GP ; Graphic Piping system

MAPS-NC ; Graphic Steel plate Cutting system

MAPS-DATA ; MD 7000 work station terminal

MAPS-GRAPH ; YM9000 satellite graphic terminal

MAPS-M ; Modularized plant production

Why MAPS-GP?

- . High . . . Low Economic Development**
- .Alter company's need**
 - .Reduce Input Cost**
 - Shorten the EXEC. Time**
 - .Change Organization**
- .Enhance production design**
- Ž Distributed System Request**

Long Range Plan of MAPS-GP

Step	Range	Object	Technology	Need
IV	1970-75	<ul style="list-style-type: none"> Ž Numerical Information System Ž Automated Pipe Shop 	<ul style="list-style-type: none"> .Large scale Computer Ž Part coding & Batch job 	<ul style="list-style-type: none"> Ž Mass Production system Ž Improved Shipbuilding Ž Large scale investment of equipment
	1976-78	<ul style="list-style-type: none"> Ž Separation the routine and judgement work .Elimination Part coding .Reduce the TAT' 	<ul style="list-style-type: none"> Ž Interactive Computer Graphics Ž Distributed S y s t e m s 	<ul style="list-style-type: none"> Ž Reduce ship acquisition time Ž Design power up Ž Cut the equipment
	1979-80	<ul style="list-style-type: none"> Multi purpose system Cut off the drawing work High speed data input 	<ul style="list-style-type: none"> Ž High accurate digitizer Load sharing System Large scale file 	<ul style="list-style-type: none"> Concentrate design office Wide range application Separate production design
	1981-	<ul style="list-style-type: none"> .Automated piping design Ž Perfect unmanned pipe shop 	<ul style="list-style-type: none"> Ž Computer Network Ž Advanced CAD/CAM Ž Full Automated pipe shop) 	<ul style="list-style-type: none"> Engineering power up . Concentrate production management

. The Object of II step MAPS=GP

● Low Cost

.Simultaneous operation with GNC system effective use

Ž Cost down 30% of design cost

Ž Shorten the design time

Ž Improve: the design accuracy

.Step by Step Approach

.Eliminate part coding

.Move the most load from center to work station

.Shorten T. A. T.

Ž Output Production Management Data

.Reduce the Pipe shop idle time

System's Characteristics

Interactive Graphics

- z Tutorial Operation**
- z Function Key**
- z Easy Programming**
- instant Correcting Errors**

Operation Functions

Ž Pipe Line Generation

(Piping Root, Node Point, Branch)

. S e t t i n g p a r t s

.Valve, Reducer, Flange, Elbow , ...

Ž Pipe piece Data Generation

Ž NC Cutting & Fitting control Data

Ž NC Bender Data

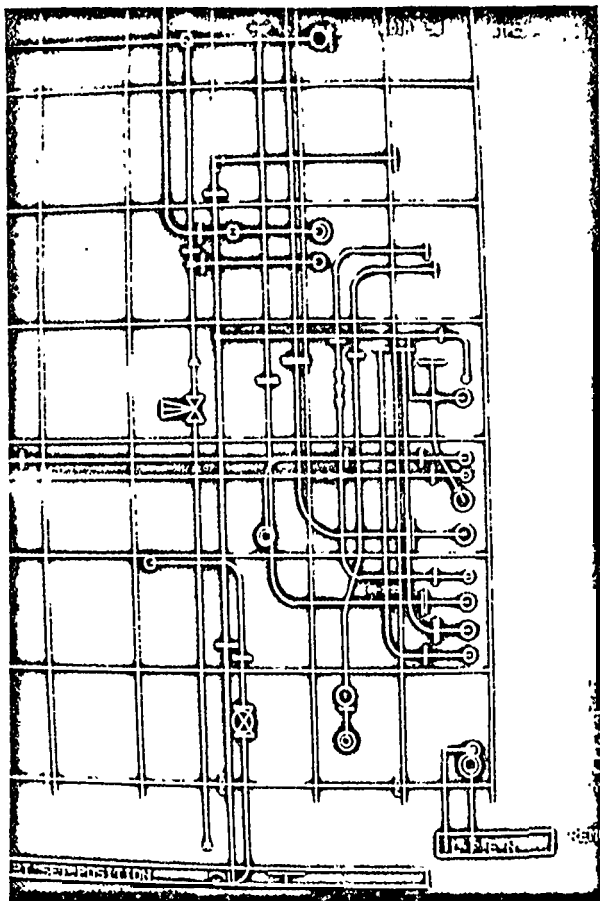
Ž pipe piece Drawing Dimension, comment

Ž Scale

Ž View change

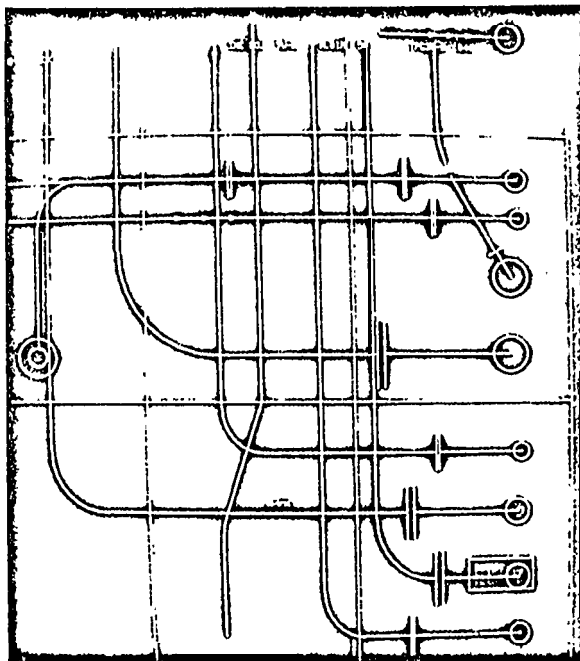
Ž Display Hull Line

Ž Change

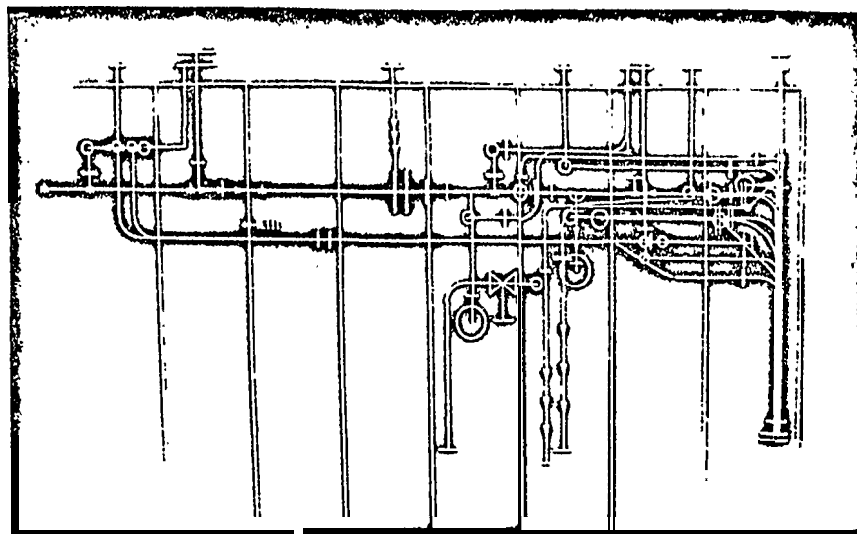
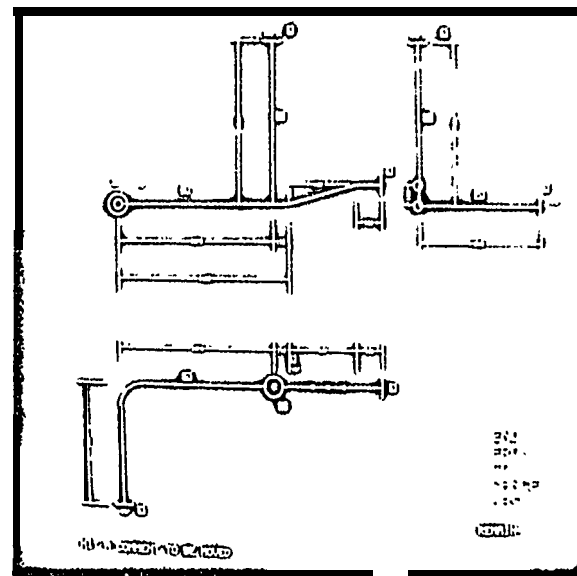


Plan

scale up



pipe piece



view
change

YM-9000 GRAPHIC DISPLAY

Remote (Full, Half duplex), or Local

- **Refresh type CRT display**
- **17 or 21 inch Screen**
- **2048 X 2048 dot matrix**
- **16 intensities**
- **Blinking, Scroll, Rotate**
- **Light pen, Tablet**
- **Random scan**
- **Analogue stroke**
- **using 2 μ processors**

MAPS - GP Software

^m Application Software

Geometric functions

File data management

- **Interactive graphic package (I. G. P.)**
- **standard data file maintenance**

^ž Generate production management data

^Ž Support Software

. G O S (Graphic Oprating System)

.Multi programming (4 job)

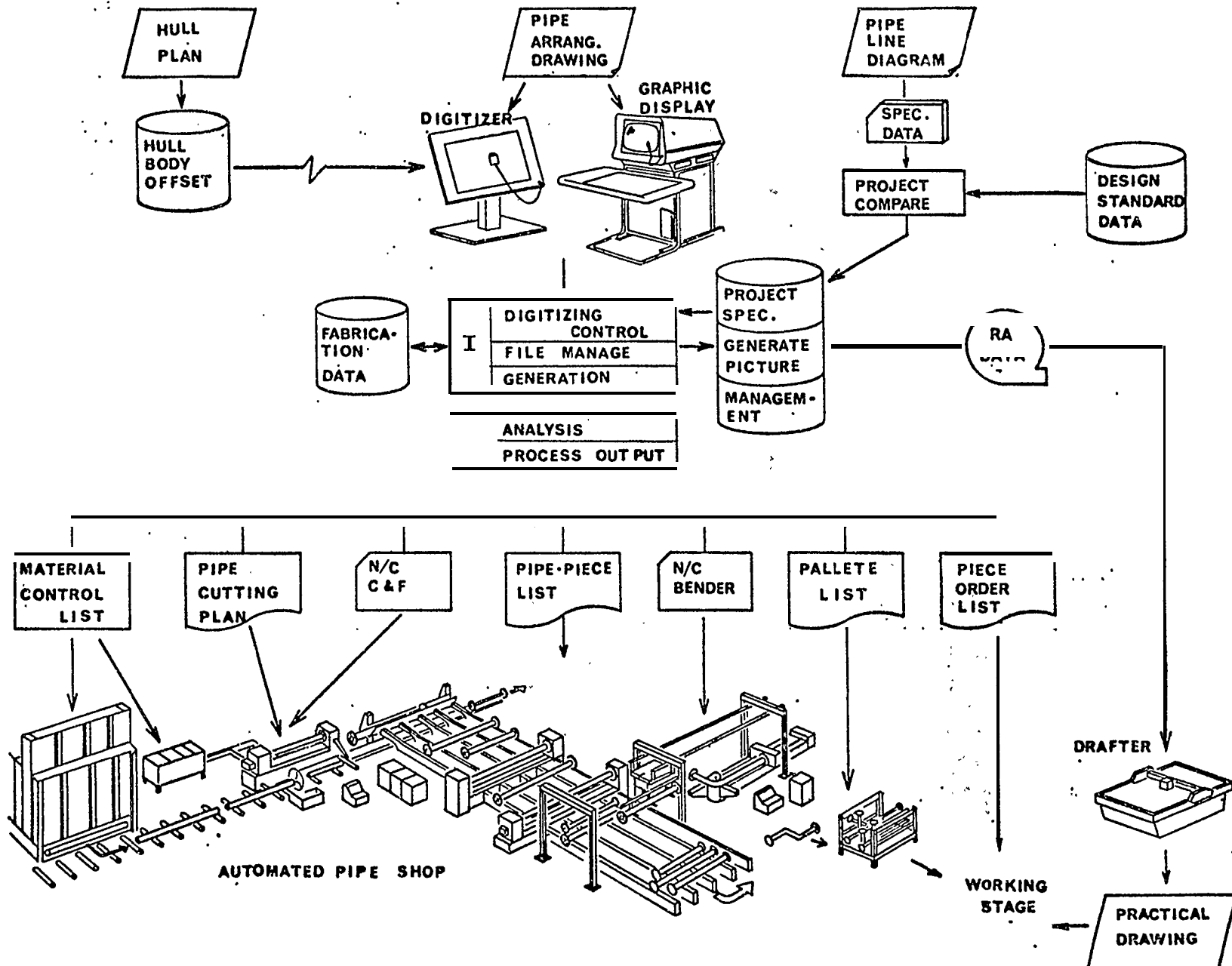
.Virtual memory management

.Fortran executable

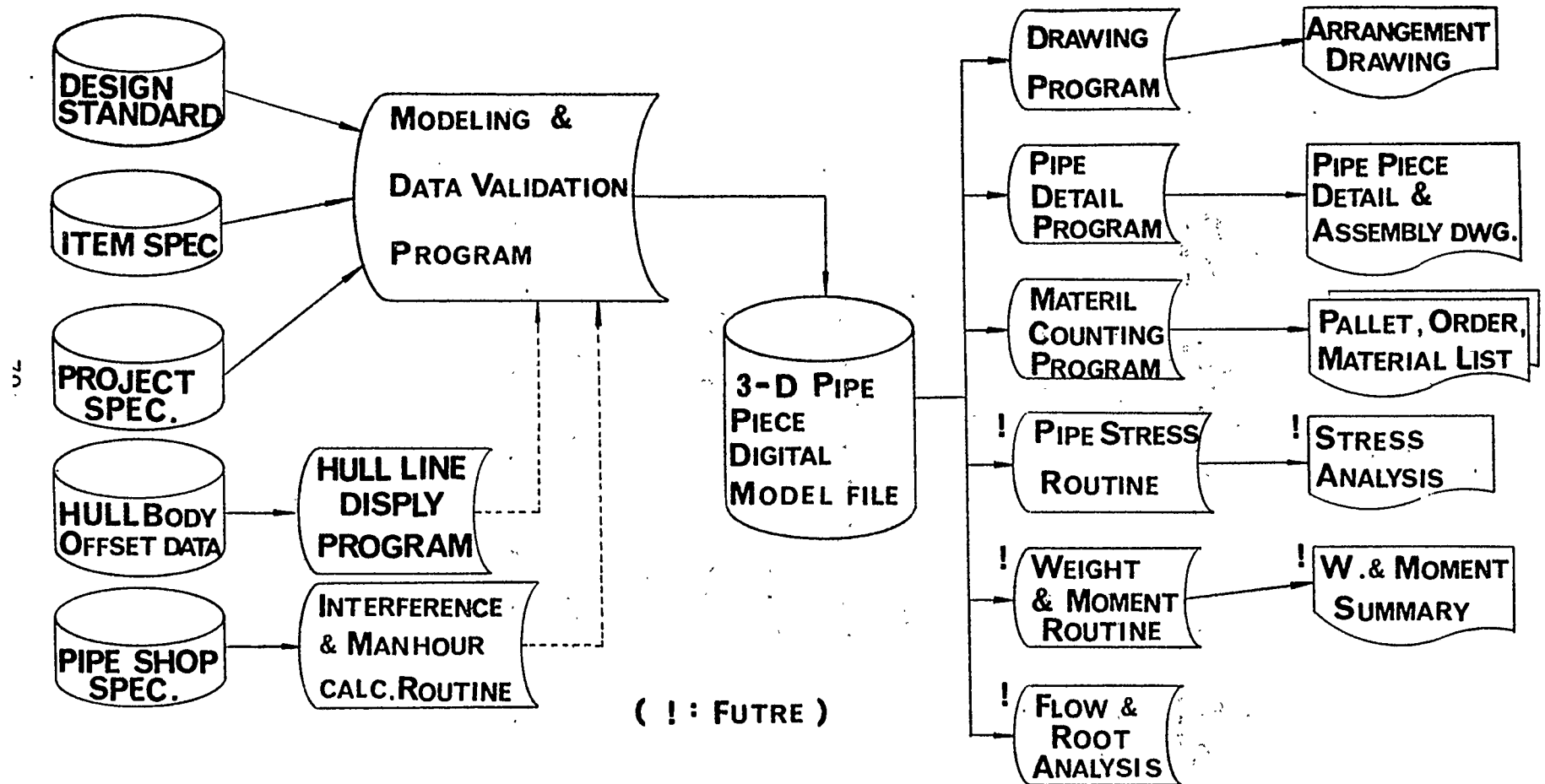
III Step MAPS-GP

- Improve the Istep MAPS-GP
- ž Complete it as a tool of production design
- promote the high contact with pipe shop”
- ž Link with host machine (2400 ~ 48000 bpS)
 - Load Sharing System
 - Work Station Type
- Yard plan Drawing

System Diagram



OVERVIEW of FILES & SOFTWARE



MAPS - GP & OBJECTIVES:

- **Total production cost down**
 - **Low cost automation**
 - **Enhanced Management control**
- ž **Maximize Man power & System resource**
- ž **Full Modularized System**
 - **Flexible system**
 - **Coordinate CAD/CAM System**
 - **Interface Engineering/Manufacturing**
 - **General purpose System**
- ž **Promote GP system use by wide segment of industry**

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